

#### HOW TO DETECT BURROWING NEMATODE WHEN MAKING ANNUAL NURSERY INSPECTIONS.

R. P. Esser, J. H. O'Bannon, and R. A. Clark<sup>1</sup>

Burrowing nematode (Radopholus similis (Cobb, 1893) Thorne, 1949) is the most important regulatory nematode pest in Florida. It was first found attacking citrus in 1953, and subsequently was determined to be the cause of "spreading decline" a devastating disease of citrus. Early surveys revealed an extensive host range, and the presence of burrowing nematode in many Florida nurseries. In addition to Florida, burrowing nematode is regulated by the states of California, Louisiana, Texas, and by many foreign countries. Certification to states and countries that have imposed regulations to prevent the introduction or limit the spread of this pest generally require that all plants with roots and all growing media associated with the plants to be certified must be found free of burrowing nematode. As a result of these requirements, the occurrence of burrowing nematode in a Florida nursery can have a serious economic impact on the nursery operation. Initial detections can result in destruction of most of the plants at the site of the nematode infection (Fig. 1). The detection of this pest in a nursery not only limits the market potential of the plants, but may also limit the land use of the environs surrounding the nursery. Interceptions or detections of burrowing nematode by receiving states and countries often result in plant shipments being quarantined or refused entry.

#### BURROWING NEMATODE SURVEY PROCEDURES

Target site history: A nematological history of the target site is an important consideration in a burrowing nematode survey. The surveyor should be aware if burrowing nematode has been previously detected at the site or if the grower has purchased large numbers of plants from another grower and placed them in the target site. A number of new burrowing nematode infestations are known to have occurred when growers purchased burrowing nematode infected plants from an uncertified nursery and moved the infected plants in with his existing stock.

Target site selection: Mixtures of plants in one bed and/or plant age mixtures within a single site (Fig. 3) and groups of plants exhibiting disease symptoms are prime areas for burrowing nematode sampling in a nursery. Burrowing nematode induces black necrotic areas (lesions) in infected plant roots, stunting (Fig. 2), and chlorosis. Unless root lesions are large, abundant, and severe they will be difficult to see due to soil clinging to the roots, so the surveyor should concentrate his or her attention on plants that are stunted, unthrifty, or are showing various degrees of chlorosis. Burrowing nematode infestations usually involve a group of plants. A single sick plant in a group of healthy plants is usually suffering from a malady other than an infection by burrowing nematode. Such a plant should, nonetheless, be included in the sample.

Target host selection: Consult Table 1, selecting host plants present in the survey site. Key hosts are plants in Table 1 with the greatest frequency of occurrence (number of times the nematode has been found infecting/infesting the host). Locate, if present, preferential hosts of burrowing nematode such as neanthabella palm (Fig. 3), pothos (Fig. 4), or philodendron. Take random samples. Each sample consists of five soil plug subsamples, 3/4" x 8" (1.9 x 20 cm) including root pieces in the plugs, and soil and roots from plants that show severe stunting or chlorosis. In the absence of dramatic symptoms, select target plants in early stages of stunting, decline, or weak chlorosis. If no plants show symptoms of nematode injury, take a random sample in the target area, including as many preferential target hosts as feasible.

Sanitation: Sampling tools should be clean when the survey site is entered, and should be disinfected prior to exiting the site.

---

<sup>1</sup>Nematologist & Chief Nematologist, respectively, Bureau of Nematology, and Chief of Plant Inspection, Division of Plant Industry, P.O. Box 1269, Gainesville, FL 32602.

Table 1. Principal target hosts of burrowing nematode in Florida ornamental nurseries, based on 695 burrowing nematode occurrences.

#### TOP 10 TARGET HOSTS

##### Plant Host/Frequency of Occurrence

1. Anthurium sp./17	Philodendron cordatum/37
2. Buxus sp./15	P. hastatum/34
3. Calathea sp./10	P. imbe/6
4. Chamaedorea elegans/42	8. Maranta sp./45
5. Citrus sp./208	9. Musa paradisiaca/8
6. Epipremnum sp./30	M. sapientum/56
7. Philodendron sp./81	10. Syngonium sp./16

#### ADDITIONAL TARGET HOSTS

11. Eugenia sp./4	18. Peperomia sp./9
12. Gladiolus sp./9	19. Persea americana/3
13. Hedychium sp./3	20. Psidium sp./6
14. Hemigraphis colorata/4	21. Rhapsis sp./4
15. Hibiscus sp./4	22. Saintpaulia ionantha/4
16. Ixora sp./4	23. Spathiphyllum sp./4
17. Jasminum sp./7	24. Viburnum sp./3



Fig. 1. A planting of burrowing nematode infested anthuriums being removed for destruction.

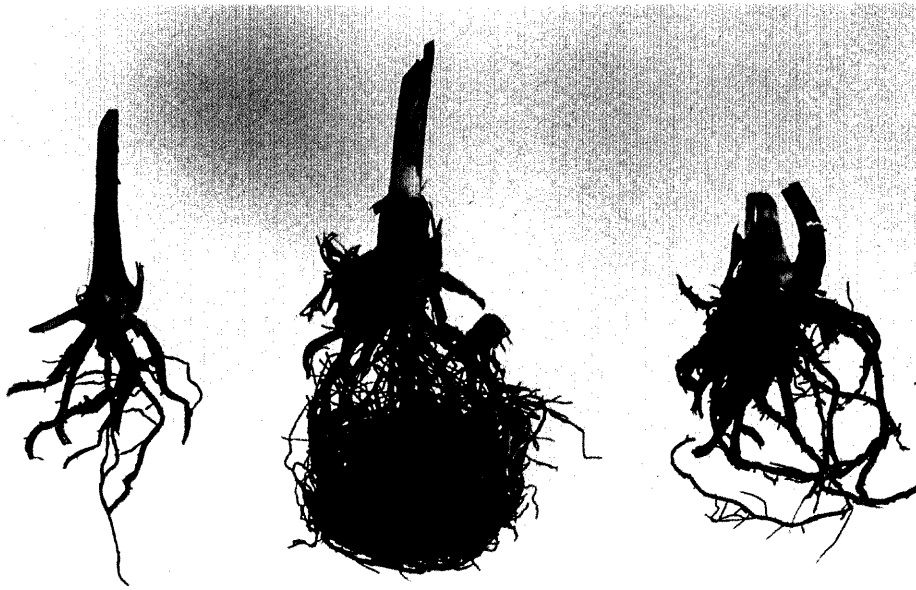


Fig. 2. *Chamaedorea erumpens* roots. Center: healthy; left and right: stunted and lesioned by burrowing nematode invasion.



Fig. 3. Burrowing nematode infested *Neanthabella* palm one of the prime target hosts of burrowing nematode, located in a mixed plant, mixed age planting.

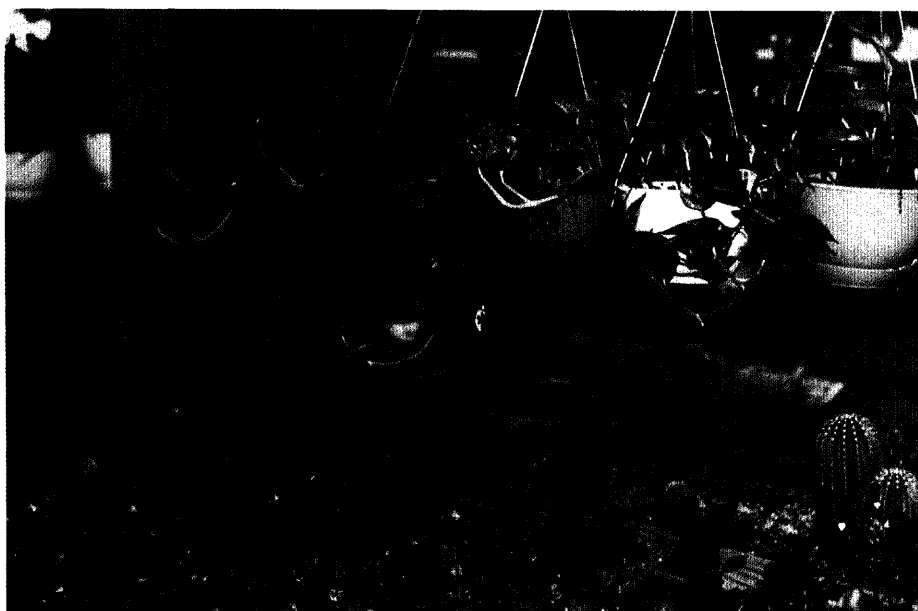


Fig. 4. Pothos. Hanging baskets infested with burrowing nematode over a bench planting.